

KRAMER ELECTRONICS, Ltd.

USER MANUAL

Kramer Distribution Amplifiers

PICO TOOL Models:

PT102A

PT102S

PT102V

IMPORTANT: Before proceeding, please read paragraph entitled
"Unpacking and Contents"

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1 INTRODUCTION

Congratulations on your purchase of this Kramer Electronics Distribution Amplifier. Since 1981 Kramer has been dedicated to the development and manufacture of high quality video/audio equipment. The Kramer line has become an integral part of many of the best production and presentation facilities around the world. In recent years, Kramer has redesigned and upgraded most of the line, making the best even better. Kramer's line of professional video/audio electronics is one of the most versatile and complete available, and is a true leader in terms of quality, workmanship, price/performance ratio and innovation. In addition to the Kramer line of high quality distribution amplifiers, such as the one you have just purchased, Kramer also offers a full line of high quality switchers, processors, interfaces, controllers and computer-related products.

This manual includes configuration, operation and option information for the following products from the Kramer line of distribution amplifier PICO TOOLS. All these PICO TOOLS are similar in operation and features.

- **PT102A - 1:2 Audio Distribution Amplifier**
- **PT102S - 1:2 s-Video Distribution Amplifier**
- **PT102V - 1:2 Video Distribution Amplifier**

1.1 A Word on Video/Audio Distribution Amplifiers

Video/Audio Distribution Amplifiers described in this manual, distribute one signal to several users. They vary in the number of outputs, operating format and bandwidth. Video/Audio distribution amplifiers are used to distribute one source to several acceptors (monitors, audio devices etc.) for simultaneous recording or monitoring of one source, with no discernible signal degradation. A good quality distributor amplifies the incoming signal, pre-compensates the signal for potential losses (resulting from the use of long cables, noisy sources, etc.) and generates several identical buffered and amplified outputs. Often, a signal processor is inserted between the source and the distribution amplifier for correction and fine-tuning of the source signal before multiplication, so that all copies are corrected in the same way. Typical applications of the machines are: audio/video duplication, studios delivering undiminished quality duplicates and video showrooms delivering an identical signal to several acceptors. The front panels of these Kramer distribution amplifiers are designed to be simple to operate.

1.2 Factors Affecting Quality of Results

There are many factors affecting the quality of results when signals are transmitted from a source to an acceptor:

- **Connection cables** - Low quality cables are susceptible to interference; they degrade signal quality due to poor matching and cause elevated noise levels. They should therefore be of the best quality.
- **Sockets and connectors of the sources and acceptors** - So often ignored, they should be of highest quality, since "Zero Ohm" connection resistance is the objective. Sockets and connectors also must match the required impedance (75ohm in video). Cheap, low quality connectors tend to rust, thus causing breaks in the signal path.
- **Amplifying circuitry** - Must have quality performance when the desired result is high linearity, low distortion and low noise operation.
- **Distance between sources and acceptors** - Plays a major role in the final result. For long distances (over 15 meters) between sources and acceptors, special measures should be taken in order to avoid cable losses. These include using higher quality cables or adding line amplifiers.
- **Interference from neighboring electrical appliances** - These can have an adverse effect on signal quality. Balanced audio lines are less prone to interference, but unbalanced audio should be installed far from any mains power cables, electric motors, transmitters, etc. even when the cables are shielded.

2 SPECIFICATIONS

	PT102A	PT102S	PT102V
Function	1:2 Audio DA	1:2 s-Video DA	1:2 Video DA
Input	1 Stereo Audio, 1Vpp/20k on a 3.5mm mini phone connector	1 s-Video, 0.7Vpp /75Ω (Y), 0.3Vpp /75Ω (C), on a 4P connector.	1 Video, 1Vpp /75Ω on a BNC connector.
Outputs	2 Stereo Audio, 1Vpp/150 Ω on 3.5mm mini phone connectors	2 s-Video, 0.7Vpp /75Ω (Y), 0.3Vpp /75Ω (C), on 4P connectors.	2 Video, 1Vpp /75Ω on BNC connectors.
Level Control	-50 to + 18.8 dB	-2 to +5 dB Y GAIN -2 to +5 dB C GAIN	-0.7 to +2.3 dB Gain 0 to + 2.2 dB EQ. @ 4.43 MHz
Input/Output Coupling	AC	AC	AC
Bandwidth	100 kHz, -3dB	150 MHz -3dB (Y)	430 MHz -3dB
Differential Gain	NA	< 0.03% (Y)	< 0.16%
Differential Phase	NA	0.03 Deg.	0.11 Deg.
S/N Ratio	74 dB	71.6 dB (Y)	78 dB
Max. Output Level	5.2 Vpp /150 Ω	2Vpp /75 Ω (Y)	2Vpp /75 Ω
Audio THD+Noise	<0.017%	NA	NA
Accessories	Power supply, mounting bracket	Power supply, mounting bracket	Power supply, mounting bracket
Options	Model VA-50P rack mountable power supply with six 12VDC outlets	Model VA-50P rack mountable power supply with six 12VDC outlets	Model VA-50P rack mountable power supply with six 12VDC outlets
Dimensions (W, D, H)	6.5 cm X 6 cm X 2.5 cm (2.55" X 2.36" X 1", W, D, H)	6.5 cm X 6 cm X 2.5 cm (2.55" X 2.36" X 1", W, D, H)	6.5 cm X 6 cm X 2.5 cm (2.55" X 2.36" X 1", W, D, H)
Weight	0.14 Kg (0.31 Lbs.) Approx	0.14 Kg (0.31 Lbs.) Approx	0.14 Kg (0.31 Lbs.) Approx.
Power Source	12VDC, 30mA, use current limited power supply.	12VDC, 30mA, use current limited power supply.	12VDC, 30mA, use current limited power supply.

3 HOW DO I GET STARTED?

The fastest way to get started is to take your time and do everything right the first time. Taking 15 minutes to read the manual may save you a few hours later. You don't even have to read the whole manual. If a section doesn't apply to you, you don't have to spend your time reading it.

4 UNPACKING AND CONTENTS

The items contained in your Kramer distribution amplifier package are listed below. Please save the original box and packaging materials for possible future shipment.

Distribution Amplifier	Kramer Concise Product Catalog
Power Supply (12VDC)	Mounting Brackets
User Manual	4 Rubber Feet

4.1 Optional Accessories

The following accessories, which are available from Kramer, can enhance implementation of your distribution amplifier. For information regarding cables and additional accessories, contact your Kramer dealer.

- **Rack Adapter** - Used to install smaller machines in a standard 1U rack. One or more machines may be installed on each adapter.
- **BNC "Y" Connector** - Used for looping purposes and splits the incoming signal to enable connection of an additional machine.
- **SP-11** - (Video/Audio Processor) can be serially connected between the video/audio source and the distribution amplifier for video and audio control/correction. The machine provides camera control and luminance/white balance correction. The SP-11 is also capable of performing composite to Y/C conversion and bi-directional transcoding. The machine allows full control over the video signal: video gain down to full fade, log or linear definition control, log or linear contrast control, color saturation control, black level control, red, green and blue controls and a screen splitter control for "before-after" comparison. The Input switch control is "audio-follow-video".
- **104L** - (Video Line Amplifier) can be serially connected between the video source and the distribution amplifier for video line amplification and cable compensation, video field work and SDI signal distribution. Signal loss and the resulting depreciation in picture quality is a real problem in any video setup requiring considerable distance between video source and acceptors. The 104L video line amplifier, one of the KRAMER TOOLS, is a high quality amplifier, which prevents video signal losses over long cables. For best results the 104L amplifier is installed adjacent to the video source. The 104L is housed in the compact KRAMER TOOLS enclosure and is fed by a 12VDC source. High bandwidth and front accessible controls make it suitable for the most demanding analog and SDI studio applications.
- **4x1VB** - (4x1 mechanical switcher) can be serially connected between the composite video sources and the distribution amplifier for video switching. It is designed for composite video signals using BNC connectors. It accepts up to four inputs and allows the user to select any input to be routed to one output using buttons located on the side panel. High quality switching components are used to ensure minimal crosstalk and very high bandwidth. The entirely passive design of the **4x1VB** eliminates the need for a power supply. Unselected inputs are automatically terminated into a 75ohm resistor. The **4x1VB** is part of the Kramer TOOLS family of compact, high quality, cost effective solutions for a variety of applications.
- **VS-801xl** - (8x1 Composite/Single Component Video & Unbalanced Audio Switcher) allows several video/audio sources to be connected to its inputs for switching. The machine provides truly effortless switching between eight video/unbalanced audio inputs and one output. Switching is done during vertical interval, either of source no. 1 or of the video available on the external sync socket. The switcher may be controlled by touch buttons or by contact closure via a remote socket on the back of the machine. Video signal bandwidth is 225MHz (typical), allowing the machine to be used in the most demanding applications.
- **VIDEO TESTER** - A new, unique, patented, indispensable tool for the video professional, the Video Tester is used to test a video path leading to/from an amplifier. By pressing only one touch switch it can trace missing signals, distinguish between good and jittery (VCR sourced) signals, and identify the presence of good signals. Whenever a video signal is missing, because of bad connections, cable breaks or faulty sources, the Video Tester is all you need.

5 VIDEO/AUDIO DISTRIBUTION AMPLIFIERS

This section describes all the controls and connections of your distributor. Understanding all of the controls and connections helps you realize the full power of your distribution amplifier.

5.1 Getting to Know Your PT102A Distribution Amplifier

The Kramer **PT102A** is a high performance 1:2 distribution amplifier for stereo audio signals. It accepts a single input and distributes it to two identical outputs using 3.5mm mini jacks. Separate left and right gain controls allow the user to optimize signal levels.

The **PT102A** is typically used for unbalanced stereo audio sources such as VCR's, portable cassette and CD players, computer sound cards, etc., but can also distribute a balanced mono signal using readily available adapter cables. It is also the ideal companion to video Pico TOOLS such as the **PT102V** and **PT102S**. A 12V-power supply is provided.

The **PT102A** is part of the new Kramer Pico TOOLS family of products for applications requiring uncompromising quality and compact size at an affordable price.

Panel features of the **PT102A** are described in Figure 1 and Table 1.

NOTE

For operation instructions refer to section 10.

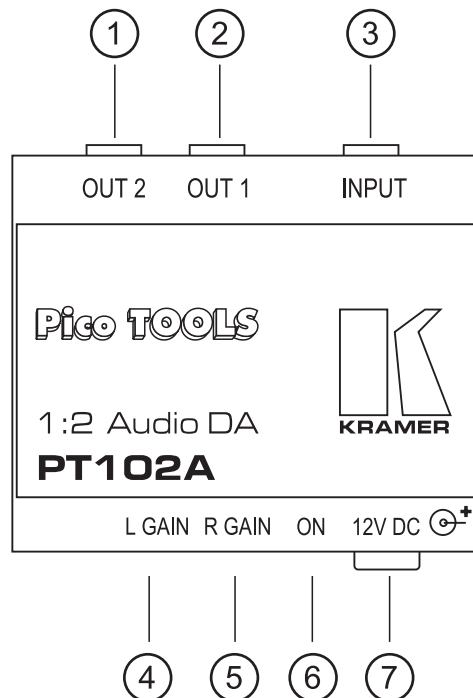


Figure 1: PT102A Panel Features

Table 1: PT102A Panel Features

No.	Feature	Function
1.	OUT 2	Buffered and amplified audio stereo output # 2
2.	OUT 1	Buffered and amplified audio stereo output # 1
3.	INPUT	Audio stereo input
4.	L GAIN	Controls output level of left audio channel
5.	R GAIN	Controls output level of right audio channel
6.	ON LED	Glows when power is applied.
7.	12VDC feed connector	A DC connector that allows power to be supplied to the unit.

5.2 Getting to Know Your PT102S Distribution Amplifier

The Kramer **PT102S** is a high performance 1:2 distribution amplifier for s-Video (Y/C) signals. It accepts a single input and distributes it to two identical outputs using 4 pin connectors.

Video bandwidth of 150MHz ensures that the **PT102S** remains transparent even in the most critical applications. It is the ideal companion to the **PT102A** audio Pico TOOL. A 12V power supply is included.

The **PT102S** is part of the new Kramer Pico TOOLS family of products for applications requiring uncompromising quality and compact size at an affordable price.

Panel features of the **PT102S** are described in Figure 2 and Table 2.

NOTE

For operation instructions refer to section 10.

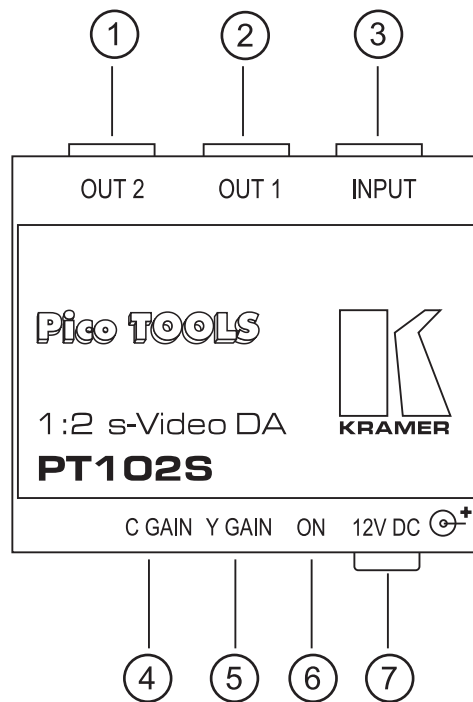


Figure 2: PT102S Panel Features

Table 2: PT102S Panel Features

NO.	Feature	Function
1.	OUT 2	Buffered and amplified s-Video (YC) output # 2
2.	OUT 1	Buffered and amplified s-Video (YC) output # 1
3.	INPUT	S-Video (YC) input
4.	C GAIN	Controls Chroma (Chrominance, C) output levels
5.	Y GAIN	Controls Luma (Luminance, Y) output levels
6.	ON LED	Glows when power is applied.
7.	12VDC feed connector	A DC connector that allows power to be supplied to the unit.

5.3 Getting to Know Your PT102V Distribution Amplifier

The Kramer **PT102V** is a high performance 1:2 distribution amplifier for composite video signals. It accepts a single input and distributes it to two identical outputs using BNC connectors. Video bandwidth of 430MHz ensures that the **PT102V** remains transparent even in the most critical applications. It is the ideal companion to the model **PT102A** audio Pico TOOL. A 12V power supply is included.

The **PT102V** is part of the new Kramer Pico TOOLS family of products for applications requiring uncompromising quality and compact size at an affordable price.

Panel features of the **PT102V** are described in Figure 3 and Table 3.

NOTE

For operation instructions refer to section 10.

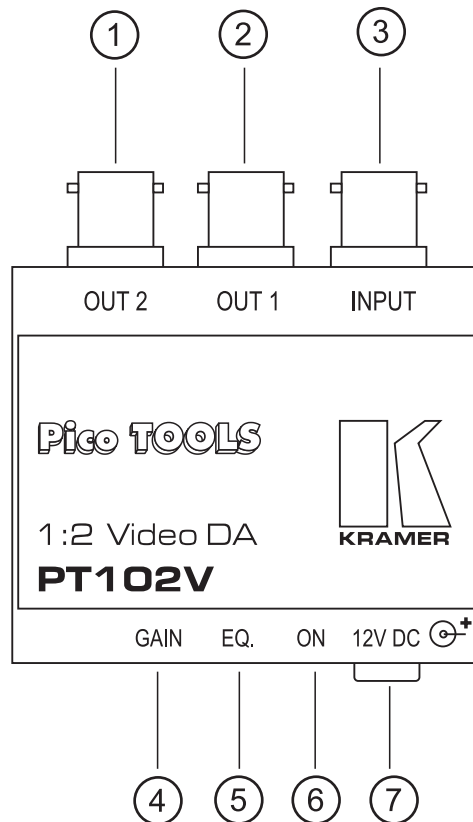


Figure 3: PT102V Panel Features

Table 3: PT102V Panel Features

NO.	Feature	Function
1.	OUT 2	Buffered and amplified Video output # 2
2.	OUT 1	Buffered and amplified Video output # 1
3.	INPUT	Video input
4.	GAIN	Controls video output levels
5.	EQ.	Controls cable EQUALIZATION for the video outputs
6.	ON LED	Glowes when power is applied.
7.	12VDC feed connector	A DC connector that allows power to be supplied to the unit.

6 TYPICAL APPLICATIONS

IMPORTANT NOTE: The built-in trimmers were factory pre-adjusted to assure 1:1 transparent operation. Readjusting the trimmers by the user can upset this transparency.

6.1 Typical Video Distribution

Figure 4 illustrates a typical setup of one of the distribution amplifiers described in this manual. An incoming single input from a source (VCR) is split into two identical outputs, and connected to acceptors.

Perform the following steps (as necessary):

- 1) Connect the output of the video source to the video **INPUT** connector of the distribution amplifier (PT102V in this case).
- 2) Connect the **OUTPUTS** of the PT102V to the inputs of up to two video acceptors.
- 3) Operate the source, acceptors and the PT102V.
- 4) Use, only if necessary, the **GAIN** and **EQ.** trimmers to control the gain and cable Equalization of the video outputs (see section 11.2 for more details).

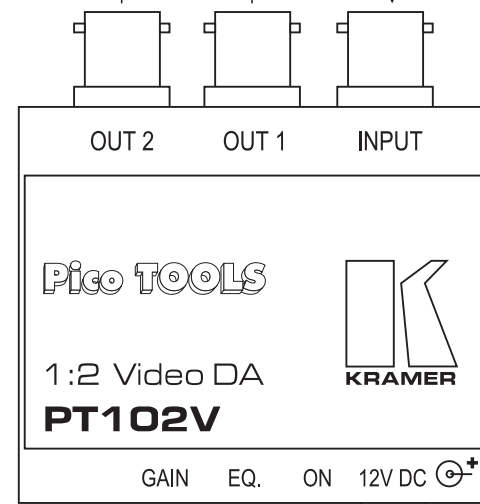
Recording VCR or Monitor



Recording VCR or Monitor



Playing VCR



Adjust, if necessary,
Gain and EQ. Controls

12 DC Power
Supply

Figure 4: Typical Video Distribution

6.2 Increasing the Number of Outputs

To increase the number of outputs, the audio/video distribution amplifiers described in this manual can be linked by setting up a cascaded configuration. It is not recommended to cascade more than two machines. An example is set below how to get an additional output when cascading two PT102A. Perform the following steps:

- 1) Connect an audio source to the **INPUT** connector of the first PT102A.
- 2) Connect one acceptor to the **OUT1** connectors of the first PT102A.
- 3) Connect an audio cable from the **OUT2** connector of the first PT102A to the **INPUT** connector of the cascaded PT102A.
- 4) Connect up to two audio acceptors to the **OUTPUT** connectors of the cascaded PT102A.
- 5) Operate the distribution amplifiers, source and acceptors.
- 6) Use the **R, L GAIN** trimmers to control the left/right audio levels.

6.3 Increasing the Number of Inputs

When it is necessary to handle more than one input, a video switcher such as the 4x1VB, or a bigger one such as the 801x1, can be used to select the required input to be switched to the outputs. The 4x1VB for example, can be serially connected between the video sources and the distribution amplifier for video switching. It is designed for composite video signals using BNC connectors, accepts up to four inputs and allows the user to select any input to be routed to one output using buttons located on the side panel.

A typical switching configuration is described below, where one of four video inputs is selected by a 4x1VB switcher and then outputted to a PT102V input. To extend the number of switcher outputs, up to two acceptors can be connected to the PT102V for video distribution of the selected input.

Perform the following steps:

- 1) Connect up to four video sources to the **IN1-IN4** BNC connectors of the 4x1VB.
- 2) Connect a cable from the **OUTPUT** connector of the 4x1VB to the **INPUT** connector of the PT102V.
- 3) Connect up to two video acceptors to the **output** connectors of the PT102V.
- 4) Use the **INPUT SELECTOR** switches of the 4x1VB to select the desired input to be switched.
- 5) Operate the 4x1VB, PT102V, sources and acceptors.
- 6) **DO NOT USE** the **GAIN** and **EQ.** trimmers of the PT102V to control the level of the output signal, unless it is absolutely necessary! Please see the note at the beginning of this chapter.

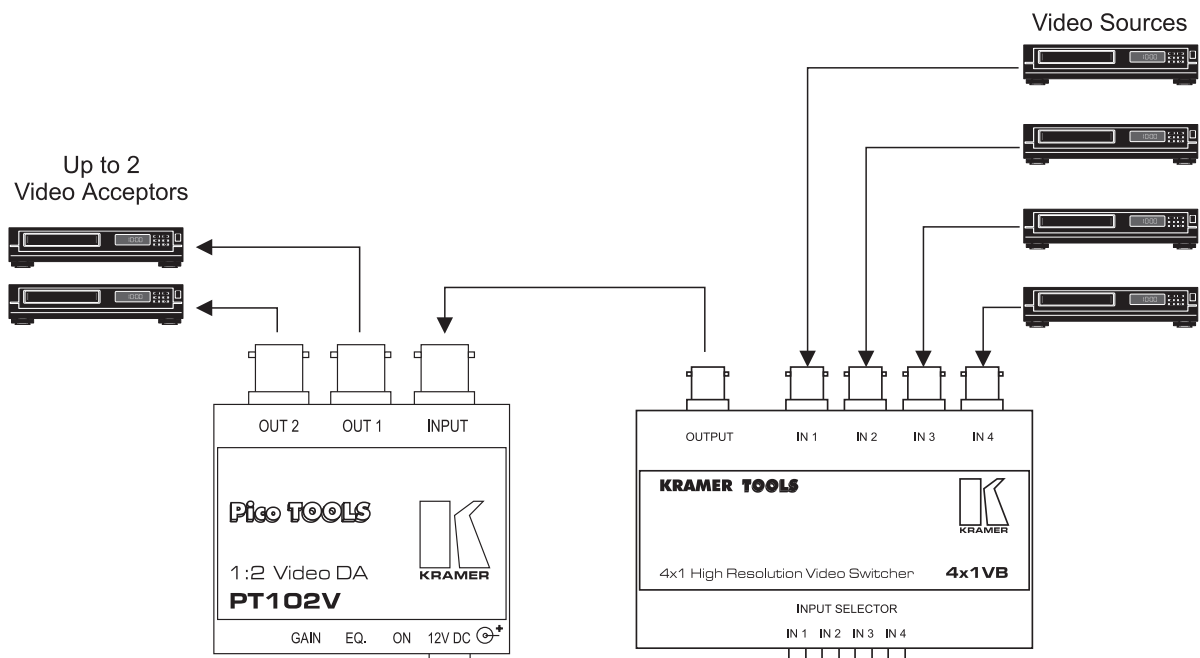


Figure 5: Increasing the Number of Inputs

7 CONNECTING TO VIDEO DEVICES

Video sources and output devices (such as monitors, projectors or recorders) may be connected to the PICO TOOLS through the BNC type connectors (PT102V) or through the 4P connectors (PT102S) located on the back of the unit. If you use separate Y and C cables for the distribution of s-Video, the cables must be of equal lengths. The signals supported by the various models are composite and S-video signals.

8 CONNECTING TO AUDIO DEVICES

Audio sources and output devices (such as amplifiers or recorders) may be connected to the PICO TOOLS through the 3.5mm mini phone type connectors (PT102A) located at the back of the machine. The signals supported are Stereo-Audio and Balanced Mono.

9 USING THE MACHINES

9.1 Turning on the Machine

NOTES

- 1) The machine should only be turned on after all connections are completed and all source devices have been turned on. Do not attempt to connect or disconnect any video or audio signals to the machine while it is turned on.
 - 2) The socket-outlet should be near the equipment and should be easily accessible. To fully disconnect equipment, remove the power supply adapter from the mains socket.
- 1) Connect the machine's DC socket to the power supply (provided with the machine). Observe proper polarity! Observe that the LED on the panel is illuminated.
 - 2) Operate the source and the acceptors.

9.2 Gain and EQ. Control (PT102V only)

The Gain Control function enables the operator to adjust the picture intensity level and compensate for losses caused by cables which are too long or non-standard. The EQ. Control pre-compensates for cable losses. The control trimmers should be used only if you are absolutely sure that the problem arises from the cables or connectors. Unnecessary use of those trimmers will upset the factory adjustments and the 1:1 signal transparency will be lost.

9.3 Luma Control (PT102S only)

The Luma Level control should be treated similarly to the Video Gain control described above. Unnecessary adjustments will upset the 1:1 signal transparency. Equalization problems that occur due to long or non-standard cables, resulting in fine detail loss may be further compensated by using the Kramer VM-9YC Y Equalization Control function.

9.4 Chroma Control (PT102S only)

The Chroma Level control should be treated similarly to the Video Gain control described above. Unnecessary adjustments will upset the 1:1 signal transparency. Problems that occur due to long or non-standard cables, resulting in color distortion problems may be further compensated by using the Kramer VM-9YC Chroma Equalization Control functions.

9.5 Audio Level Control (PT102A)

To adjust the audio level, simply adjust the **L**, **R** audio level trimmers until a satisfactory audio level is achieved.

10 TAKING CARE OF YOUR MACHINE

Do not locate your machine in an environment where it is susceptible to dust or moisture. Both of these may damage the electronics, and cause erratic operation or failure. Do not locate your machine where temperature and humidity may be excessive. Doing so may also damage the electronics, and cause erratic operation or failure of your machine. Do not clean your machine with abrasives or strong cleaners. Doing so may remove or damage the finish, or may allow moisture to build up. Take care not to allow dust or particles to build up inside unused or open connectors.

11 TROUBLESHOOTING

NOTES

1. *Please note that if the output signal is disturbed or interrupted by very strong external electromagnetic interference, it should return and stabilize when such interference ends. If not, disconnect power from the machine and reconnect again to reset the machine.*
2. *If the following recommended actions still do not result in satisfactory operation, please consult your KRAMER Dealer.*

11.1 Power and Indicators

Problem	Remedy
No power	<ol style="list-style-type: none"> 1. Confirm that power connections are secured at the machine and at the receptacle. Make sure the receptacle is active, outputting the proper voltage. 2. If there is still no power use a Philips screwdriver to remove screws on both sides of the machine and remove the panel. 3. Locate fuse inside your machine. The fuse looks like a little jumper. If necessary replace fuse with another, with the same rating. 4. Install cover by replacing the Philips screws.

11.2 Video Signal

Problem	Remedy
No video at the output device, regardless of input selected.	<ol style="list-style-type: none"> 1. Confirm that your source and output devices are turned on and connected properly. The input of your machine should be of an identical signal format at the output of your source. Signals at the output of your machine should be of an identical signal format as at the input of your display. 2. Confirm that any other device in the signal path have the proper input and/or output selected. 3. Use the Video Tester to test the video path leading to/from your machine (see section 4.1 "Video Tester")
Video level is too high or too dim.	<ol style="list-style-type: none"> 1. Verify that the lines are well matched through 75ohm impedances. 2. Confirm that the connecting cables are of high quality and properly inserted. 3. Check level controls located on your source input device or output display.

<p>Noise bars are "rolling" up or down in the output image</p> <p>or:</p> <p>Low Frequency Hum in the output signal</p>	<p>Hum bars (ground loop) are caused by a difference in the ground potential of any two or more devices connected to your signal path.</p> <p style="text-align: center;">WARNING!</p> <p style="text-align: center;"><i>Do not disconnect the ground from any piece of video equipment in your signal path!</i></p> <p>Check the following to remove hum bars:</p> <ol style="list-style-type: none"> 1. Confirm that all interconnected equipment is connected to the same phase of power, if possible. 2. Remove equipment connected to that phase that may introduce noise, such as motors, generators, etc. 3. Disconnect all interconnect cables and reconnect them one at a time until ground loop reappears. Disconnect the affected cable and replace, or insert an isolation transformer in the signal path.
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11.3 Audio Signal

Problem	Remedy
<p>No audio at the output device, regardless of input selected</p>	<ol style="list-style-type: none"> 1. Confirm that your sources and output device are turned on and connected properly. Audio signals connected to the input of your machine should be properly wired to the output of your source. Audio signals connected to the output of your machine should be properly wired to the input of your machine or recorder. 2. Confirm that any other amplifiers in the signal path have the proper input and/or output selected. Pay special attention to input amplifiers that may be built into your acceptor.
<p>Audio level is too low</p>	<ol style="list-style-type: none"> 1. Confirm that the connecting cables are of high quality and properly built. Take special care in noting the wiring configuration of balanced to unbalanced cables. 2. Check level controls located on your source input device or output display or recorder.

LIMITED WARRANTY

Kramer Electronics (hereafter Kramer) warrants this product to be free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

- 1) Any product which is not distributed by Kramer or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the web site **www.kramerelectronics.com**.
- 2) Any product, on which the serial number has been defaced, modified or removed.
- 3) Damage, deterioration or malfunction resulting from:
 - a) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature.
 - b) Unauthorized product modification, or failure to follow instructions supplied with the product.
 - c) Repair or attempted repair by anyone not authorized by Kramer.
 - d) Any shipment of the product (claims must be presented to the carrier).
 - e) Removal or installation of the product.
 - f) Any other cause, which does not relate to a product defect.
 - g) Cartons, equipment enclosures, cables or accessories used in conjunction with the product.

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

- 1) Removal or installations charges.
- 2) Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
- 3) Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

- 1) To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
- 2) Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
- 3) For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

Kramer's liability for any defective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

- 1) Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
- 2) Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

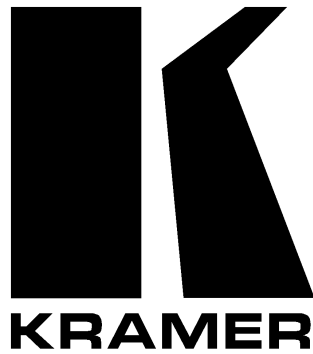
NOTICE

This equipment has been tested to determine compliance with the requirements of:

- | | |
|------------------|---|
| EN-50081: | "Electromagnetic compatibility (EMC);
generic emission standard.
Part 1: Residential, commercial and light industry" |
| EN-50082: | "Electromagnetic compatibility (EMC) generic immunity standard. Part 1:
Residential, commercial and light industry environment". |
| CFR-47 | FCC Rules and Regulations:
Part 15- "Radio frequency devices:
Subpart B- Unintentional radiators |

CAUTION

- Servicing of the above mentioned machines is only allowed to a Kramer authorized technician or Engineer. Any user who makes changes or modifications to the unit without the express approval of the manufacturer will void user authority to operate the equipment.
- Use the DC power supply (provided) to supply power to the machine and controllers.
- Please use recommended interconnect cables to connect the machine to controllers and other components.



**The list of Kramer distributors appears on our web site:
www.kramerelectronics.com
From the web site it is also possible to e-mail factory headquarters.
We welcome your questions, comments and feedback.**

KRAMER ELECTRONICS LTD.

3 Am VeOlamo Street, Jerusalem 95463, Israel Tel: (972-2)-654-4000. Fax: (972-2)-653-5369
e-mail: kramere1@netvision.net.il